PROJECT REPORT

<u>CUSTOMER CHURN ANALYSIS</u>

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Class   : 3rd Year AI&DS – 'A'

Problem Statement

A prominent telecommunications provider is currently grappling with a significant challenge regarding customer retention. Observations indicate a notable drop in the active customer base, which is creating a direct negative impact on recurring monthly revenue. While management suspects that variables such as contract duration, customer tenure, and billing totals are the primary drivers of this attrition, they currently lack the granular, actionable insights needed to intervene. This project aims to dissect customer behaviour patterns, pinpoint high-risk demographics, and deliver data-driven strategies to mitigate churn.

Project Objectives

As a Business Intelligence Analyst, the scope of this project involves:

- **Data Transformation:** Utilizing Power Query to clean and structure raw telecommunications data for analysis.

- **Churn Analysis:** Detecting specific patterns associated with customer tenure, contract types, and payment preferences.

- **Metric Calculation:** Developing custom DAX measures to ensure the Churn Rate is calculated with high precision.

- **Dashboarding:** Engineering an interactive Power BI interface to facilitate executive-level decision-making.

Tools & Technologies

- **Microsoft Power BI Desktop:** For the development of all data visualizations and the interactive dashboard.
- **Power Query:** Used for the ETL (Extract, Transform, Load) process and rigorous data cleaning.
- **DAX (Data Analysis Expressions):** Utilized for the calculation of key KPIs and custom statistical measures.
- **Dataset:** Based on the IBM Telco Customer Churn Dataset, consisting of 7,043 unique records.

Data Preparation & Modelling

Extensive data preparation was required to ensure the integrity of the final analysis:

- **Data Type Correction:** The TotalCharges field was converted from text to decimal format, and null values for customers with zero tenure were replaced with 0 to maintain dataset consistency.

- **Data Grouping:** MonthlyCharges were categorized into $20 bins to better visualize pricing trends and sensitivities.

- **Measure Creation:** A custom DAX formula was implemented to track Churn Rate dynamically:

    - *Churn Rate % = DIVIDE([Churned Customers], [Total Customers], 0)*

Executive Summary (KPIs)

7043	1869	26.5%
Total Customers	Churned Customers	Churn Rate %
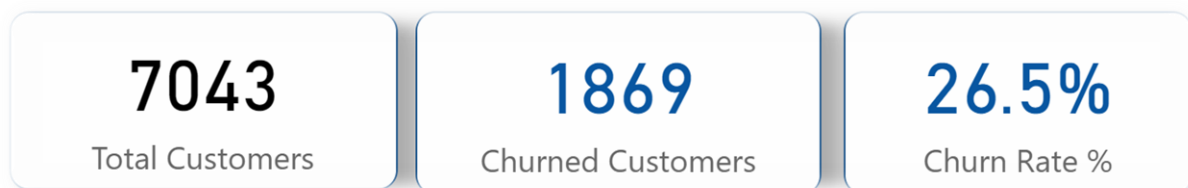
- **Total Customers Analyzed:** 7,043

- **Overall Churn Rate:** 26.5%

- **Summary Insight:** A churn rate of 26.5% is considered critical within the telecom sector, necessitating the immediate rollout of retention initiatives.

Analysis: Tenure & Contracts

Churn Rate by Contract Type

- Monthly: 42.7%
- One year: 11.3%
- Two year: 2.8%
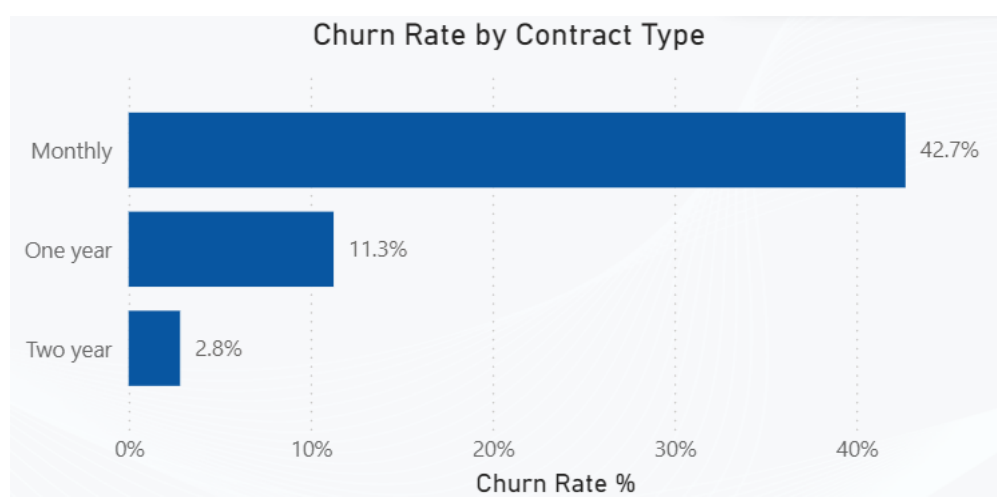
Contract Analysis: There is a drastic difference in retention based on contract length.

- **Month-to-Month Contracts:** Show an alarming **42.7%** churn rate.

- **Two-Year Contracts:** Show a minimal **2.8%** churn rate.

- **Conclusion:** Customers on flexible, short-term plans are the most volatile.

Customer Tenure Distribution
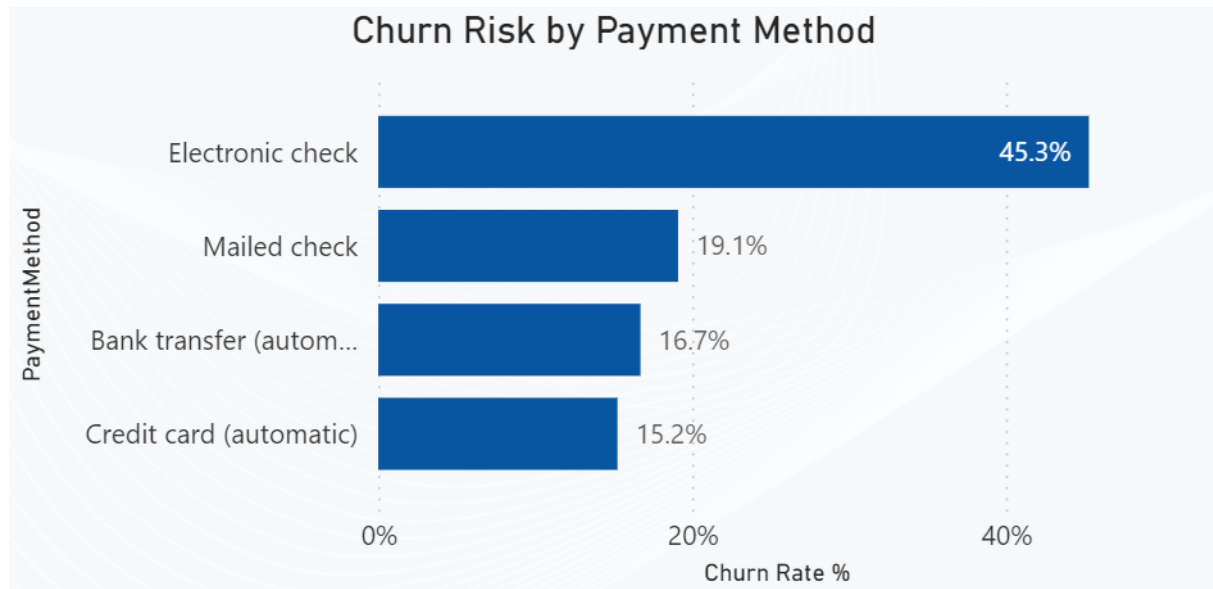
- **Tenure Analysis:** The tenure distribution is bimodal. We see a high concentration of brand-new customers (< 6 months) and loyal long-term customers (> 70 months).
- **Risk Zone:** The highest volume of churn occurs within the **first 12 months**. If a customer stays past one year, they are likely to remain loyal.

Financial Impact: Pricing & Payments

Management hypothesized that billing amounts influence churn. The data confirms this correlation.

Does Higher Bill Amount Increase Churn?
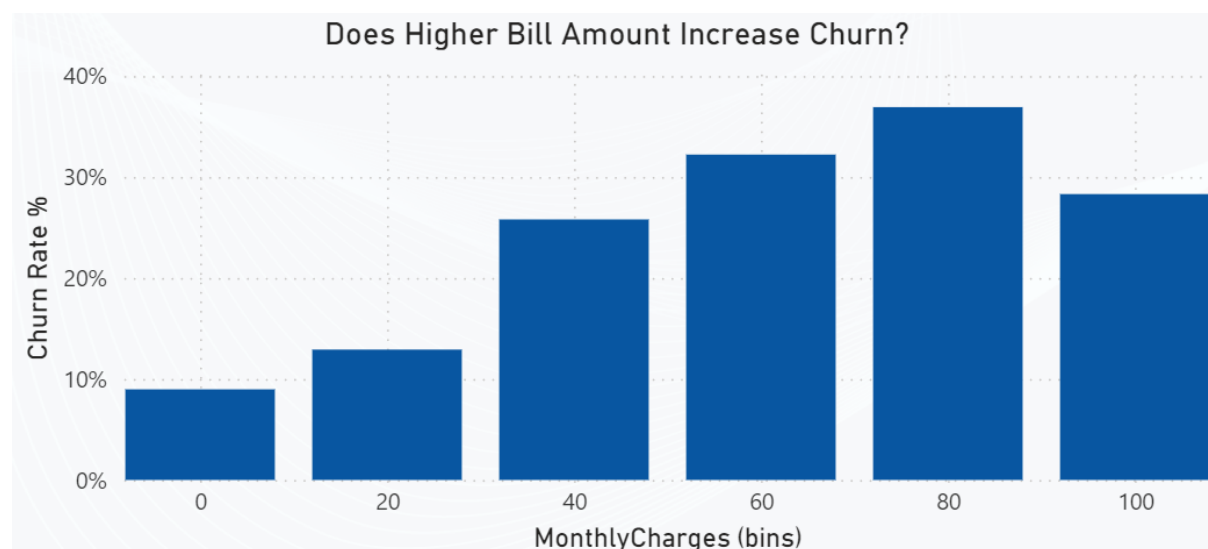
- **Pricing Sensitivity:** Churn rates are relatively low (below 20%) for customers paying less than $60/month. However, churn spikes significantly when monthly charges exceed $80.
- **Insight:** High-paying customers are leaving at a faster rate, likely due to competitor pricing or perceived lack of value.

Churn Risk by Payment Method

Payment Method	Churn Rate %
Electronic check	45.3%
Mailed check	19.1%
Bank transfer (autom…)	16.7%
Credit card (automatic)	15.2%

Payment Method Friction:

- **Electronic Check** users have the highest churn rate (**45.3%**).

- **Automated Payments** (Credit Card/Bank Transfer) show much lower churn (~15-16%).

- **Insight:** Users who have to manually pay (Electronic Check) are less "sticky" than those on auto-pay.

Strategic Recommendations

Based on the data analysis, the following actions are recommended to the retention team:

- **Migrate Monthly Users:** Implement targeted marketing campaigns offering 10-15% discounts to move high-risk monthly users into 1 or 2-year contracts.

- **Incentivize Auto-Pay:** Offer a one-time $5 bill credit to Electronic Check users who transition to Credit Card Auto-Pay to remove manual payment friction.

- **Address Price Shock:** Investigate service quality for Fiber Optic users and consider "Loyalty Price Locks" for customers paying above $80 to prevent price-driven exits.

- **Early Onboarding:** Establish a dedicated communication stream (check-ins, surveys) for customers in their first 6 months to improve the initial experience.

<u>Dashboard</u>
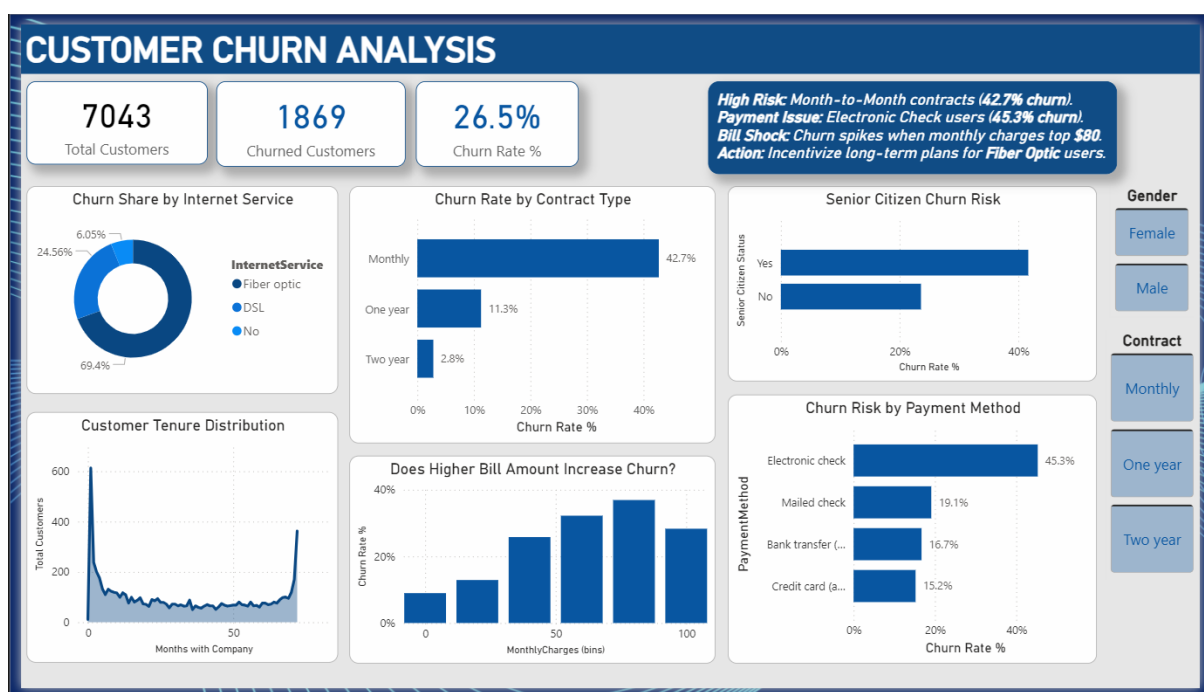
<u>Conclusion</u>

This analysis has successfully identified the primary catalysts for customer attrition: flexible short-term contracts, high monthly bill amounts, and manual payment processes. By executing the recommended strategies, the company can proactively target high-risk segments and reduce the overall churn rate from 26.5% to a more sustainable level.
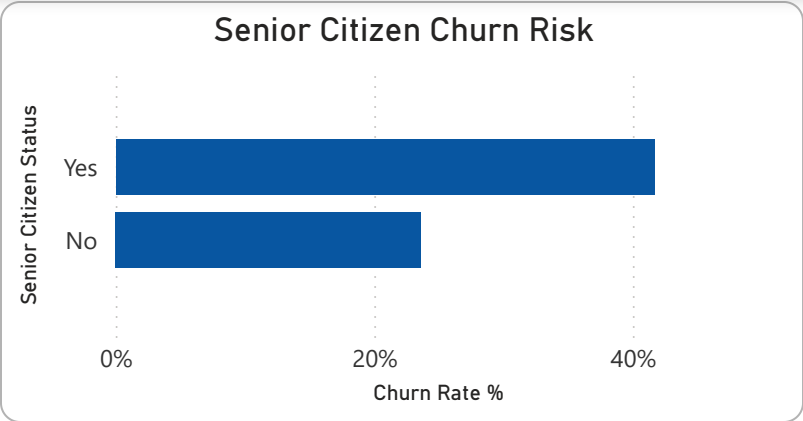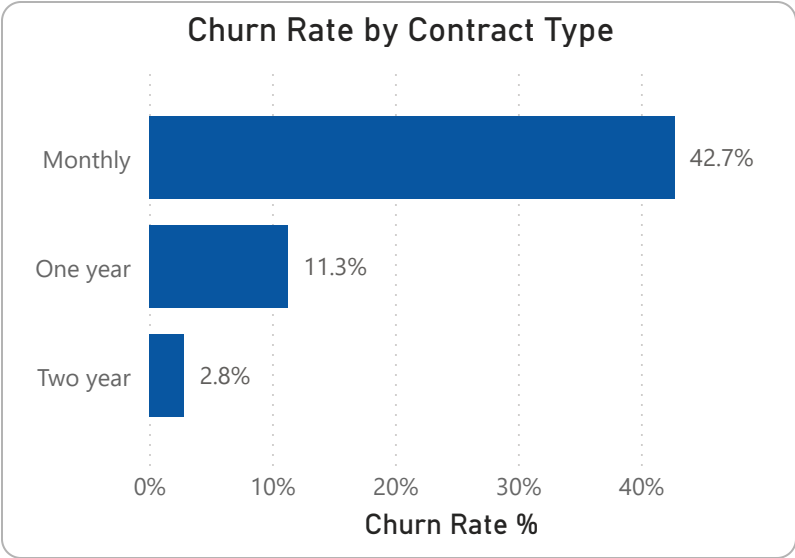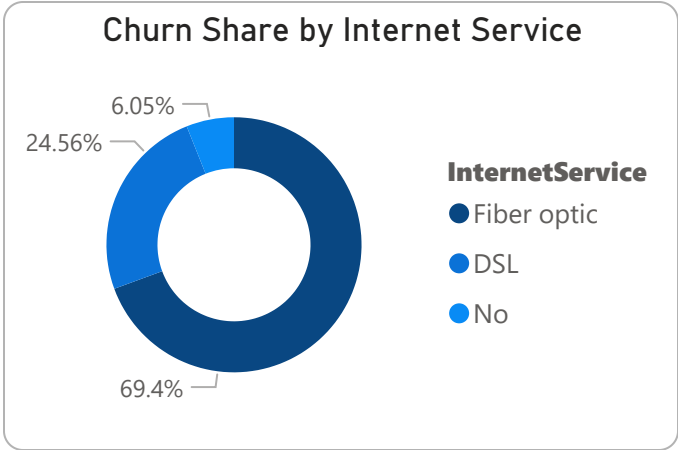
CUSTOMER CHURN ANALYSIS

7043
Total Customers
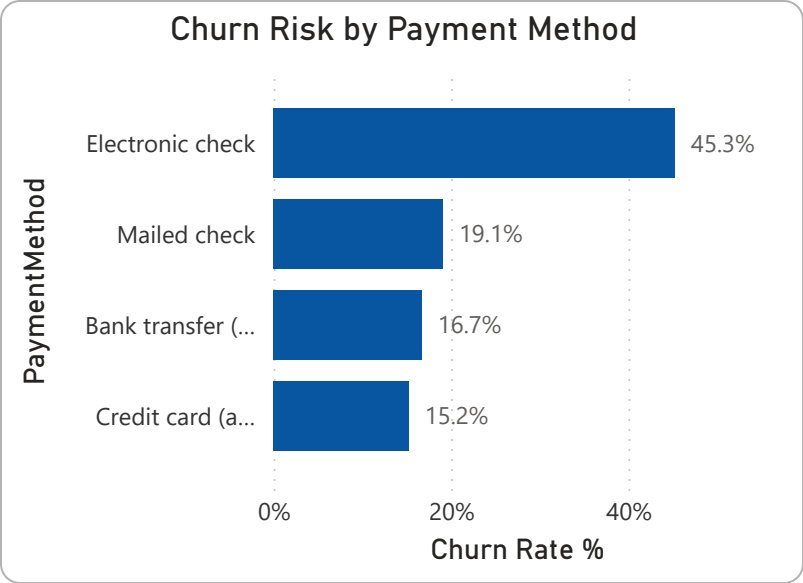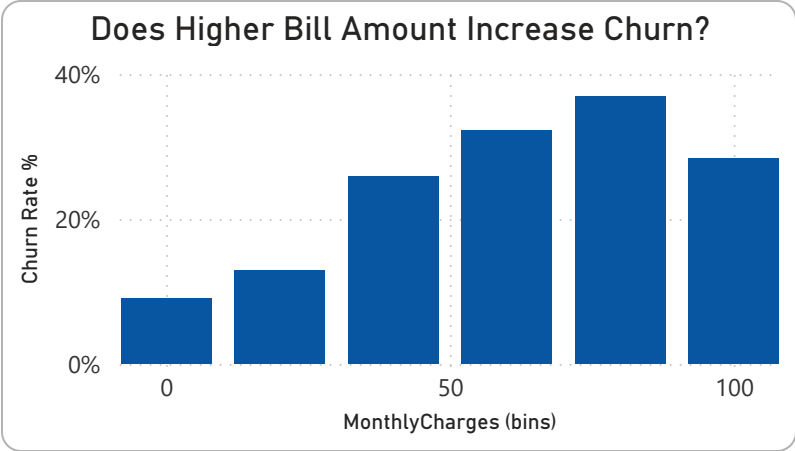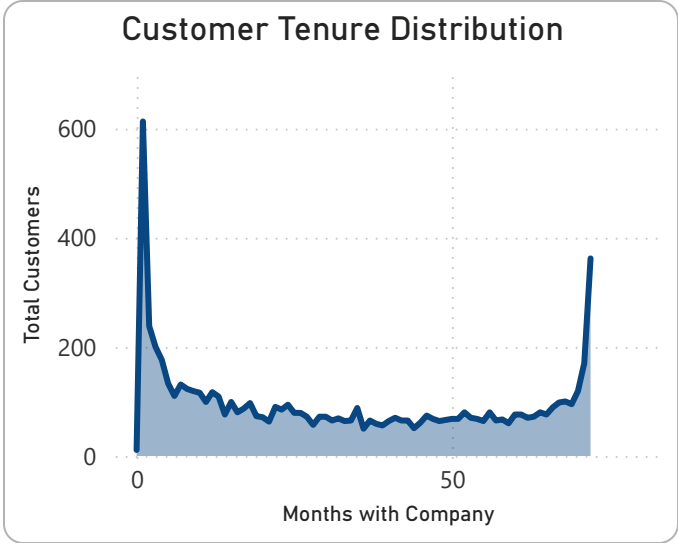
1869
Churned Customers

26.5%
Churn Rate %

High Risk: Month-to-Month contracts (*42.7% churn*).
Payment Issue: Electronic Check users (*45.3% churn*).
Bill Shock: Churn spikes when monthly charges top *$80*.
Action: Incentivize long-term plans for *Fiber Optic* users.

Churn Share by Internet Service

6.05%
24.56%
69.4%

InternetService
- Fiber optic
- DSL
- No

Churn Rate by Contract Type

Contract	Churn Rate %
Monthly	42.7%
One year	11.3%
Two year	2.8%

Senior Citizen Churn Risk

Senior Citizen Status: Yes, No
Churn Rate %: 0%, 20%, 40%

Customer Tenure Distribution

Total Customers (0, 200, 400, 600)
Months with Company (0, 50)

Does Higher Bill Amount Increase Churn?

Churn Rate % (0%, 20%, 40%)
MonthlyCharges (bins) (0, 50, 100)

Churn Risk by Payment Method

PaymentMethod	Churn Rate %
Electronic check	45.3%
Mailed check	19.1%
Bank transfer (...	16.7%
Credit card (a...	15.2%

Gender
- Female
- Male

Contract
- Monthly
- One year
- Two year